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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/485,529	03/01/2000	NICHOLAS P. HARBERD	620-91	2031

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EXAMINER

IBRAHIM, MEDINA AHMED

ART UNIT	PAPER NUMBER
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1638

DATE MAILED: 11/05/2002

20

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.  
**09/485,529**

Applicant(s)  
**HARBERD et al**

Examiner  
**M dina A. Ibrahim**

Art Unit  
**1638**



**– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –**

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on Jul 8, 2002
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1035 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1, 3-6, 10-15, 17-29, 32-46, and 48-54 is/are pending in the application.
- 4a) Of the above, claim(s) 51-54 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1, 3-5, 26, and 27 is/are allowed.
- 6) ☒ Claim(s) 6, 14, 15, 17-25, 28, 29, 32-46, 48, and 49 is/are rejected.
- 7) ☒ Claim(s) 50 is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirements.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some\* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

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### **DETAILED ACTION**

Applicants' response of 07/08/02 (amendment E) has been entered. Applicants' petition of 07/08/02 from the restriction requirement has been granted in-part. The restriction requirement between Groups I and II and the requirement to elect one sequence have been withdrawn. Therefore, claims 1, 3-6, 10-15, 17-12, 32-46, 48-50 are under examination. Claims 51-54 remain withdrawn as being directed to the non-elected invention. Therefore, claims 1, 3-6, 10-15, 17-29, 32-46, 48-54 are pending.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

All previous rejections and objections not stated below have been withdrawn.

#### ***Claim Rejections - 35 USC § 112, 2nd paragraph***

Claims 10-15, 17-25, 28-29, 32-46, 48-49 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 10-13 are indefinite for depending upon cancelled claim 9.

In claim 14, "resistance" be changed to ---resistant---, for clarification.

Dependent claims 15, 17-25 are included in the rejection.

In claim 17, depending from claim 15, is the deleted amino acid sequence of SEQ ID NO:103 in addition to the deleted sequence of SEQ ID NO:104?

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In claim 19, depending from claim 18, is the deleted amino acid sequence of SEQ ID NO:106 in addition to the deleted "one or more amino acids"? Dependent claim 20 is included in the rejection.

In claims 21 and 22, depending from claim 18, is the deleted amino acid sequence of SEQ ID NO:101 and 102, respectively, in addition to the deleted "one or more amino acids"?

In claim 24, depending from claim 23, is the deleted amino acid sequence of SEQ ID NO:106 in addition to the deleted "one or more amino acid"? Dependent claim 25 is included in the rejection.

In claim 28, it is suggested that ---according to claim 1, be inserted before "wherein", and "according to claim 1" before "is" be deleted, for clarification. Dependent claim 29 is included in the rejection.

In claim 32, "suitable" renders the claim indefinite as it implies that the vector may or may not be suitable for transformation of a plant cell. It is suggested that "suitable" be deleted, for clarification.

Claims 33 and 44 are indefinite because it is unclear if the heterologous polynucleotide also comprises the isolated polynucleotide of claim 1. An insertion of ---, each--- before comprising would obviate the rejection. Dependent claims 34-43 and 45.

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In claim 34, it is suggested that "microbial" be replaced with --- is a microbial cell---, for clarification.

In claim 36, "having heterologous said polynucleotide" is unclear. It is suggested that "having heterologous said polynucleotide" be replaced with ---having said heterologous polynucleotide---, as indicated in the last Office action. Claim 37 is included in the rejection.

In claim 39, "said polynucleotide" lacks proper dependency. It is suggested that "said polynucleotide" be changed to ---said heterologous polynucleotide---.

In claim 40, it is unclear what "cell genome nucleic acid" means. If Applicant intends ---incorporating the heterologous polynucleotide into cell genome---, "nucleic acid" should be deleted.

Claim 41 is indefinite because it is unclear if a plant can be regenerated because no plant cell is recited in claims 39 or 33.

Claim 44 is indefinite because "nucleic acid vector according to claim 1" lacks antecedent basis. Dependent claim 45 is included in the rejection.

Claim 46 is indefinite for failing to recite complete method steps that resulted a plant with influenced growth

***Claim Rejections - 35 USC § 112, 1st paragraph***

Claims 6 and 14-15 remain rejected and claims 17-27 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the

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isolated polynucleotide sequences of SEQ ID NO:12 and 14-15 encoding a polypeptide that confers growth inhibition in a plant and the polynucleotides encoding SEQ ID NO:5, 7-8 with specified partial amino acid sequences deleted having GA-unresponsive dwarfing activity, and method for using said polynucleotides for the production of dwarfed plants, does not reasonably provide enablement for any isolated polynucleotide which specifically hybridizes under particular hybridization conditions to SEQ ID NO:14 and encoding a polypeptide that retains dwarfing activity or a method for producing said polynucleotide. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to the invention commensurate in scope with these claims.

Claims 6 and 14 are drawn to any isolated polynucleotide that hybridizes under specific hybridization conditions to the Rht polynucleotide sequence of SEQ ID NO:14 and still encoding a polypeptide which on expression in a plant provides inhibition of growth. Claim 6 further recites partial amino acid sequence of SEQ ID NO:104 and requires that inhibition is antagonized by gibberellin. Claim 14 recites that the polypeptide confers gibberellin -unresponsive dwarfing phenotype. The specification provided guidance only for the unmodified polynucleotide sequences of SEQ ID NO: 12, 14 and 15 encoding the polypeptide sequences of SEQ ID NO:5, 7, 8 that confers inhibition of growth in plants, which inhibition is antagonized by gibberellin, a method for isolating (producing) said polynucleotide sequences by using specific primers and

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specific hybridization conditions, and a method for using them to induce dwarfism in a plant. The specification also discloses the polynucleotide sequences encoding SEQ ID NO:5, 7, 8 with specific partial amino acid sequences deleted, which on expression in a plant confer GA-unresponsive dwarfing phenotype. The specification has not provided guidance for a polynucleotide sequence that hybridizes under the specified hybridization to the disclosed sequence and encoding a polypeptide which upon expressing in a plant confers inhibition of growth, which inhibition is antagonized by gibberellin. The specification has not provided guidance for a polynucleotide sequence that hybridizes under the specified hybridization conditions to the disclosed sequence and still encoding any of the polypeptide recited in claims 15, 17-27 which upon expression in a plant confers gibberellin -unresponsive dwarfism. No guidance has been provided regarding any modification to the disclosed nucleotide sequences that resulted the polynucleotides of claims 6 and 14 (and dependents 15, 17-27). Neither the state of the prior art nor Applicants' specification provides evidence that any and all polynucleotide sequences that hybridize to each other under the stringency conditions set forth in claims 6 and 14 would encode functionally related polypeptides. The state of the prior art as exemplified by Lazar et al and Broun disclosed in pages 11-12 of the last Office action, teach proteins that differ in one or few amino acids but still are different in function. Applicants note that the nucleic acid sequences encoding the proteins disclosed by either Lazar et al or Broun et al would hybridize to each other

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under the hybridization conditions set forth in claims 6 and 14. Therefore, it is unpredictable whether any and all polynucleotides of claims 6 and 14 would encode a polypeptide having the recited functional activity. Therefore, without further guidance, one skilled in the art would not be able to make the polynucleotide of claims 6 and 14 and/or use them for dwarfing plants, without undue experimentations. Further, claims 18 and 23 ( depending from claim 14), recite a polypeptide sequence of SEQ ID NO:8 or 5 with one or more amino acids deleted and that still retains GA-unresponsive growth inhibition activity. However, the specification has not provided sufficient guidance as to which one or more amino acids in SEQ ID NO:8 or 5 can be deleted so that the polypeptide activity is retained. The state of the prior art teaches unpredictability inherent in protein function when any one more amino acids in that protein is deleted (see also Lazar et al and Broun disclosed in the last Office action). Therefore, absent any specific guidance, it is unpredictable as to whether any one or more amino acid deletion in any of the disclosed sequences will retain the polypeptide activity.

Therefore, given the lack of guidance; the unpredictability inherent in protein function; the state of the prior art, as discussed above, one skilled in the art would not be able to practice the claimed invention without undue experimentations, as stated in the Office action.



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### ***Response to Arguments***

The rejection to claims 6 and 14-15 (and as applied to new claims 17-27) is repeated for the same reasons as set forth in pages 9-13 of the Office action mailed 02/06/02. Applicants' arguments have been fully considered but are not persuasive.

Contrary to Applicants' arguments in pages 15-17 of the response, claims drawn to any isolated polynucleotide that hybridizes under the hybridization conditions of claims 6 and 14 to the Rht polynucleotide sequence of SEQ ID NO:14 and still encoding a polypeptide which on expression in a plant provides inhibition of growth or dwarfism (GA-responsive or un-responsive), or a method for producing the polynucleotide of claim 6 are not supported by an enabling disclosure for the reasons discussed above and in the last Office action. While hybridization techniques and assays for testing whether a polypeptide has GA-responsive dwarfing activity are well within the level of one skilled in the art and clearly would not require undue experimentations, making and testing all the polynucleotides of claims 6, 14-15 and 17-27 that meet the structural and the functional limitations recited in the claims are not considered to be routine. These tests are considered undue experimentations, given the state of the art, the unpredictable nature of the invention, the limited guidance and working examples in the specification. Therefore, the rejection is maintained

### ***Written Description***

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Claims 6, 14-15 remain rejected and claims 17-27 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The claimed invention lacks written description under current written description guidelines. The claims are drawn to any and all isolated polynucleotides which hybridize to the Rht polynucleotide of SEQ ID NO:14 and polynucleotides encoding polypeptide sequences of SEQ ID NO:5, 7 or 8 having one or more amino acids and/or specific partial amino acid sequence deleted. The functional limitations of the claims require that the polynucleotides encode a polypeptide that confers inhibition of growth in a plant, which inhibition is antagonized by gibberellin or a polypeptide which confers gibberellin-unresponsive dwarfism. However, neither Applicants' response nor the prior art has shown that the claimed polynucleotides with the specified structural limitation are predictable to exhibit the recited functional limitation. As indicated in the above rejection (scope of enablement), the state of the prior art as exemplified by Lazar et al and Broun et al teaches unpredictability inherent in protein function when or more amino acids in that protein is deleted. The reference also provides that not all polynucleotide sequences that hybridize to each other under high stringency conditions or that share high sequence identity would necessarily encode proteins of similar function. Therefore, contrary to Applicant's arguments in pages the

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written description requirement for the polynucleotides of claims 6, 14-15, 17-27 is not satisfied. Therefore, a person skilled in the art would not recognize from the disclosure that Applicant was in possession of the invention as broadly claimed.

**Remarks**

Claims 1-6, 10-29, and 32-46 and 48-50 are deemed free of the prior art.

Claims 1, 3-5, 26-27 and 48-50 are allowable.

Papers relating to this application may be submitted to Technology Sector 1 by facsimile transmission. Papers should be faxed to Crystal Mall 1, Art Unit 1638, using fax number (703) 308-4242. All Technology Sector 1 fax machines are available to receive transmissions 24 hrs/day, 7 days/wk. Please note that the faxing of such papers must conform with the Notice published in the Official Gazette, 1096 OG 30, (November 15, 1989).

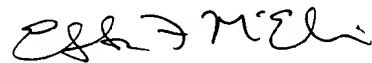
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Medina A. Ibrahim whose telephone number is (703) 306-5822. The Examiner can normally be reached Monday -Thursday from 8:30 AM to 5:00 PM and every other Friday from 9:00AM-5:30PM .

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Amy Nelson, can be reached at (703) 306-3218.

Any inquiry of a general nature or relating to the status of this application should be directed to the receptionist whose telephone number is (703) 308-0196.

October 28, 2002

mai

  
**ELIZABETH F. McELWAIN**  
**PRIMARY EXAMINER**  
**GROUP 1800**